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# Engendering the Scholarship of Problem-based Learning

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# Engendering the Scholarship of Problem-based Learning

## Abstract

In this case-based research article, we describe how the implementation an instructional method, problem-based learning, across disciplines at a single institution stimulated scholarship on teaching among the faculty involved in the project. We conducted interviews with 30 participating faculty and administrators and triangulated these data with a document analysis of project documents, course portfolios, meeting minutes, and the project Web site. Our institutional-level analysis focuses on the campus environment and how it supported and/or constricted the scholarship of teaching across campus. At the faculty-level, we describe faculty perceptions about and experiences with producing scholarship on their own teaching.

## Keywords

Problem-based learning, PBL, Scholarship of teaching, SoTL

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## **Engendering the Scholarship of Problem-based Learning**

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### **Abstract**

In this case-based research article, we describe how the implementation an instructional method, problem-based learning, across disciplines at a single institution stimulated scholarship on teaching among the faculty involved in the project. We conducted interviews with 30 participating faculty and administrators and triangulated these data with a document analysis of project documents, course portfolios, meeting minutes, and the project Web site. Our institutional-level analysis focuses on the campus environment and how it supported and/or constricted the scholarship of teaching across campus. At the faculty-level, we describe faculty perceptions about and experiences with producing scholarship on their own teaching.

### **Introduction**

"...and for myself, I made the decision that if I'm going to do this [PBL], I've got to make it count, so I've written a couple of things. I've done presentations at conferences, I've done some consulting and all of that kind of stuff, and I figure if I'm going to be spending time on this rather than doing something else, I've got to have something to show for it. ...And I'm kind of putting together a pretty good niche, I think, in geography, as kind of college teaching in geography that I've published something in the *Journal of Geography in Higher Education*, which is a special journal."

--Geography faculty member who uses PBL

With increased attention on teaching and learning in higher education in the new millennium, innovative pedagogies, such as computer-based learning, case-based learning, cooperative learning, collaborative learning, inquiry-based learning, research-based learning, project-based learning, and problem-based learning, have begun to take hold. Problem-based learning, a dramatic change from traditional instruction, is no exception. A growing body of scholarly literature has developed that explicates the nuances of implementing these innovative instructional strategies.

While several authors have called for faculty to engage in the scholarship of teaching (Boyer, 1990; Glassick, Huber, & Maeroff, 1997), there has been little investigation into the institutional environments that might promote faculty engagement in the scholarship of

teaching. In this article, we explore how scholarship on innovative teaching approaches can be stimulated within an institutional environment. Two areas of research form the framework for our study: the scholarship of teaching and faculty thinking about problem-based learning.

### **Scholarship of Teaching**

In parallel to the introduction of innovative pedagogies have come changes in the way that scholars of higher education theorize and conduct research about how faculty conceptualize their teaching. Such research goes beyond the evaluation of a particular pedagogy and focuses on the changes that will occur as the culture of the academy promotes the value of teaching (Hutchings, 2000; Schon, 1995). This conceptualization perhaps began with the publication of *Scholarship Reconsidered*, in which Ernest Boyer (Boyer, 1990) suggested that our conception of faculty scholarship, which traditionally focused on peer-reviewed discovery research in a discipline, be expanded to include a wider array of the intellectual work that faculty perform. His proposed definition of scholarship includes faculty's endeavors in the areas of discovery, integration, application, and teaching. Boyer's focus on the intellectual work of teaching, in particular, has inspired many individuals, as well as institutions, to reexamine the value placed upon college teaching.

While the idea that the intellectual work of teaching is equivalent to and as valuable as the intellectual work of discovery is appealing to many, the issue of assessing that intellectual work has been a persistent problem. *Scholarship Assessed* (Glassick, Huber, & Maeroff, 1997), the 1997 follow-up to *Scholarship Reconsidered*, argues that faculty should provide evidence that can be evaluated against a set of standards for all types of scholarly endeavors. These authors argue that teaching, and other forms of scholarship, in order to be truly equated with research, must meet similar rigorous standards of peer review.

There are many possible forms of evidence of the scholarship of teaching. Presentations at professional conferences, publications of research on teaching, and some forms of consulting work are well suited to add to our general understanding of the nuances of teaching. These forms of scholarship not only provide a public forum for evaluating an individual faculty's work as a teacher, but they also make public the intellectual work required for excellence in teaching (Hutchings, 1994; Shulman, 1993, 1999). This changing definition of the scholarship of teaching serves as the theoretical framework for our study.

### **Faculty Thinking about Problem-Based Learning**

Most of the research on PBL has focused on student outcomes, but recently studies have begun to focus on PBL faculty. Research indicates that using problem-based learning has an influence on faculty members' perceptions of their teaching. For example, faculty who are familiar with PBL favor it over other instructional methods (Alabanese & Mitchell, 1993; Vernon & Blake, 1993). In a study of PBL faculty roles, Dahlgren and colleagues (1998) found that instructor perception of their roles influenced their levels of satisfaction with PBL.

In previous research (Major & Palmer, 2002), we found that using problem-based learning transforms faculty pedagogical content knowledge, the way that faculty members think about their teaching within a disciplinary context. This change occurs as faculty implement PBL and makes differences in how faculty view their students, their roles as instructor, their disciplines as well as the pedagogical choices they make. Where this research stops and where we extend it now is to explore how faculty move from innovative teaching with PBL to active engagement with scholarship about their teaching.

## Methods

### Context of the Study

Our research took place at a private, comprehensive, religiously affiliated institution that had received a major grant to implement problem-based learning. Private University engaged in a three-year project designed to encourage faculty to use problem-based learning throughout the undergraduate curriculum.

#### *First Grant*

During the planning stage of the initial grant, project administrators worked with leading scholars around the country to develop strategies to promote long-term change on Private's campus. They did not want for faculty to use problem-based learning for one term, only to abandon it because the change effort had not been adequately supported but rather wanted it to be a long-term change in the teaching and learning climate at Private. For this reason, the institution put a variety of support structures, which were designed in large part to help faculty develop knowledge of the new method and to provide them with adequate time to make changes to their teaching.

Faculty training and development activities were an essential aspect of the grant. Private University brought many experts to campus to conduct workshops on the nuances of the pedagogical approach and on how to document the transformation of courses through course portfolios. Administrators also arranged for faculty to see PBL courses in progress at other sites.

In addition to development efforts, faculty were offered financial support to provide for their time as well as material needs. Faculty working on the project received summary pay to develop courses as well as release time during the term they attempted the new method. Faculty could also request funds for materials and equipment that went beyond the bounds of departmental budgets.

Approximately one fifth of the faculty at Private participated in the grant by revising a course or courses to implement PBL. As a part of their efforts, they were to present a formal course design to their peers (faculty participating in the project) and an external review panel for suggestions and feedback. During the course the new method was implemented, faculty met regularly with design teams and with project staff. Faculty members captured their experiences in course portfolios, which they created during their courses and finalized at course completion.

Even with the additional support, which faculty noted that they valued, they found the time to develop and implement a new way of teaching to be a challenge. In particular, many of the faculty were untenured or not at full professor rank and were concerned that the additional attention to teaching was taking time away from research. Even though Private is not a research institution, faculty worried that not having sufficient publications would negatively affect promotion and tenure decisions. Faculty approached project staff and asked them to devise a plan whereby "scholarship of teaching" could count toward promotion and tenure. In particular, faculty wanted assurance that course portfolios and publications and presentations about teaching would be counted as scholarship/research in promotion and tenure reviews.

### *Second grant*

After the completion of the initial three-year project, and based upon the grass roots effort to have teaching “count,” the institution was awarded a second major grant for their efforts in the scholarship of teaching, which they primarily captured through course portfolios but which was also evident in the number of publications in scholarly journals and presentations at professional conferences that arose from the grant. The result was a national peer review project involving external review of PBL courses from the home institution and outside institutions as well. According to the grant proposal, the overarching goal for this second project was to research and develop a peer review system for PBL course and curricular portfolios to promote the scholarship of teaching. Specific project aims included the following:

- Illustrate the scholarship involved in the systematic design of PBL courses and curricula by developing review criteria that will earn national respect for the scholarship inherent in the design, delivery, assessment, and improvement of instruction validated by student learning outcomes.
- Identify various forms and mediums for PBL course portfolios. At this point, course portfolios are usually hard copy documents. In contrast, this project will explore multi-media formats for portfolio composition that will enrich the presentation of instruction and student outcomes. All forms of portfolios will be designed for effective Internet exchange.
- Conduct training on evaluation of teaching as scholarly work, with a particular focus on how PBL course portfolios may be developed and evaluated.
- Develop and continuously improve means of documenting the scholarship involved in designing, delivering, and improving PBL instruction.

It is this project that served as the context for our research.

### **Research Design**

Our research was framed around answering three central questions:

1. How and why the faculty in this study shift from innovative teachers trying a new pedagogy (PBL) to scholars who are actively engaged in the scholarship of teaching?
2. What are the institutional supports and barriers that advanced or hindered this process?
3. How did faculty participation in various activities associated with the project influence change?

To address these questions, we relied on case study methods (Merriam, 1998).

Data for our study came from multiple sources, allowing for triangulation of data. At the institutional level, we analyzed project documents, such as course portfolios (n=35), meeting minutes (one major meeting per semester for 3 years), and the project Web site to determine how this institution transformed an educational approach into a field of scholarship.

At the level of the individual faculty member, we contacted the entire population of faculty involved in the project (47) which constituted just under 20% or one fifth of fulltime faculty teaching at the institution at this time. We interviewed 31 faculty members (66% of all faculty who implemented PBL). All of the interviewed faculty had implemented PBL during the initial period of the grant, and 100% of those interviewed had moved toward the scholarship of PBL to some degree. Faculty rank ranged from assistant to full professor. In addition, faculty came from a variety of disciplines including English, mathematics, biology, physics, nursing, business, pharmacy, and education.

We used 1:1 semi-structured interviews with occasional neutral prompting to clarify explanations and to encourage additional responses. Interviews lasted from 45 minutes to one hour. We terminated additional sampling attempts when we reached saturation, that is, new interviews confirmed existing themes but did not add new themes to the analysis.

### **Data analysis**

Data were coded using QSR NUD\*IST Vivo (NVivo) software. We analyzed data by standard qualitative techniques including constant comparison (Glaser & Strauss, 1967). The experiences our participants described in interviews were compared to others, and in this way, tentative categories were developed. We referred clusters of themes back to the original descriptions to allow for reflexivity. Peer examination and member checks provided additional validation. Data interpretation was based in the experiences and perspectives of the participants. In practice, this was undertaken through inductive analysis of transcripts of the interviews.

### **Researcher Positionality and Trustworthiness**

Each author of this article brought a unique perspective to the study. The primary author of this paper was not affiliated with the institution, and thus provided an outsider or etic perspective. The second author was affiliated with Private University and the PBL project and thus provided an insider or emic perspective adding to our ability to understand the context and nuances of the data. The dual researcher perspectives, both etic and emic, provided analytic triangulation and helped to ensure the trustworthiness of the data analysis (Patton, 2002). To provide additional trustworthiness of our data, we used peer review, conducted member checks, and presented the results with thick description.

## **Results**

### **Institutional Structures That Influenced Change**

In this section, we present themes that surround the institution-wide effort to incorporate PBL that ultimately led to the documentation and acceptance of the scholarship of PBL. In particular, this section shows the project activities that faculty thought were especially helpful in making change happen at Private. Several themes emerged that illuminate how the shift occurred.

#### *Continuing a spirit of innovation.*

In the documents we reviewed, we found that constituents of the institution believed it had always had a spirit of innovation; administrators and staff often noted that the institutions efforts were ones that had always put a strong emphasis on supporting academics through curricular change and through pedagogical excellence. It had, for example, undergone several curricular revisions. Documents indicated the people believed they were a part of

the institution and a part of something innovative. Constituents were comfortable with new and different ideas and with risk-taking. This level of ease allowed them to be open to change on campus and to viewing problem-based learning as something that fit within their context. As one top-level administrator explained at a conference:

"PBL can get a campus talking and working on change and upon the learning experience, the foundation of a student's time at Private. It forces us to concentrate on students as high priority. It sends professors in new directions, looking for new resources, checking and discovering. There is vitality in this!"

Thus, constituent groups viewed problem-based learning as inherently in keeping with the university's spirit and often and readily acknowledge the new professorial role, viewing it as one in which professors must be learners as well as teachers.

#### *Developing a knowledge base.*

The documents we reviewed showed that the university made an intentional effort to raise awareness of PBL, and ultimately the scholarship of teaching, on campus. One strategy they used to accomplish this purpose was to take faculty and administrators directly to PBL sites so that they received "no secondhand, back-from-the-foreign-fields reports; faculty and administrators should see for themselves. Traveling for direct observation is more than what you go to see; it is also time on the trip for people who do not normally have quality time to discuss possibilities in-depth." Faculty explained that these trips provided them with the opportunity for direct observation of instruction so that they were able to see how PBL could work at the undergraduate level, including how programs are organized, how groups work, what faculty do, what students do, what problems look like, and what the benefits are. Direct observation seemed to provide faculty with a new awareness that not all academic cultures are alike and that not all faculty work within the same instructional paradigm. As one faculty member put it in his portfolio, the university he visited:

"...serves as an example for re-thinking our own curricular decisions and pedagogical approaches. Many of the basic ideas that guide our thinking about teaching and learning are so entrenched that we do not even consider the possibilities. The opportunity to observe another educational system quite different from our own gives us increased confidence to maintain and preserve our educational strengths and increased incentive to change those areas that need improvement."

In addition to having the opportunity to visit PBL sites, many faculty members had the opportunity to attend workshops led by leaders in the field of problem-based learning. In these workshops, faculty learned about specific techniques for implementing PBL in their classrooms, such as problem-development, group facilitation, assessment, peer tutoring, and the scholarship of teaching. Training and development opportunities were critical for faculty learning how to "do" PBL, and many faculty commented on the importance of these activities. As one faculty member noted, for example, "I believe that training, whether formal or informal, is extremely important....it would take a truly gifted instructor to make PBL work the first time with no preparation."

Constituents readily acknowledged that they needed to learn about teaching and that formal training and development provided them opportunities to do this. These workshops and



trips helped constituent groups come to understand that knowledge of teaching was something that must be developed.

*Creating opportunities for cross-campus support of teaching.*

In the documents we reviewed, we found that administrators and project staff were essential to support and facilitate the efforts of the faculty. For the purpose of the grant a campus team was created, which involved administrators, selected faculty members, and students. The purpose of this team was to provide leadership, set policy, mobilize support, review PBL courses/modules and other grant projects. A smaller School Facilitators' Team, a sub-group of the larger team, served as an advisory board and consisted of representatives from each of the five schools and project staff. The purpose of this team was to coordinate activities, review requests, recruit consultants, and serve as liaisons between the project coordinator and the school deans. This team was also to organize school-level activities according to a project portfolio put together in 1999. This team ultimately functioned in the roles of both advisory team and task force.

In part because of the desire to achieve widespread support and investment in the project and through these teams, several top-level administrators were directly involved with the project. However, these administrators believed that faculty autonomy was critical so professors could experiment with new approaches. These administrators tried to offer support rather than directive supervision or mandates. For example, one administrator noted that he could "make available opportunities and possibilities to empower people, to provide money and resources, and to offer 'no funds' encouragement to try something new." This administrator, like many others studied, indicated a desire to empower faculty by providing opportunities for them. Other administrators noted that participating faculty, in order to succeed, needed space for potential failure. As one administrator put it, "...those leading the change need some protection from recrimination for unanticipated consequences and mistakes. At the same time, advocates must be encouraged to accept criticism and to adjust when appropriate."

The thoughtfulness and awareness of these administrators and leadership teams seems to have paid off as faculty often expressed appreciation for their efforts. Indicative of this appreciation is one faculty member's comment: "I found those individuals active in the leadership of the PBL project....to be knowledgeable and accessible resources, available to address questions and concerns as they arose ....[and to provide] support and guidance essential to the success of my course." This kind of support provided faculty members with opportunities and with autonomy so that they could experiment, but also it provided them with the security necessary for experimentation to thrive.

Faculty members also worked together in collaborative teams. Three people, most often faculty members, worked together to redesign courses. One person taught the course, and two people from the same or related disciplines helped redesign it. The purpose of these teams was to design PBL courses and modules, prepare PBL materials for broad distribution, promote PBL course development by other faculty, and serve as resources on methods and materials. This seemed among the most beneficial aspects of the project, and a majority of faculty noted the importance of it. As one faculty discussed his colleagues, he noted: "The course design would have been impossible without [the associate facilitators]. They brought not only needed expertise, but also the needed synergy for brainstorming and feedback sessions." Another faculty noted that her team, which consisted of a faculty colleague and an advanced student, "proved to be an insightful balance of teaching and learning support as [she] began to integrate a PBL approach."

*Allowing for conversations about teaching.*

Many of the activities that took place on and beyond Private's campus had the effect of allowing faculty time to talk about their teaching. The ongoing conversations between and among disciplines allowed faculty to develop and refine their thinking about what teaching is. As another faculty member explained:

"I found the workshops especially helpful and informative...regarding current pedagogical issues in higher education and [they] gave me the opportunity to interact with faculty members outside my field. Furthermore, I was able to integrate some ideas and insights of faculty members from across the disciplines into my own teaching."

*Engendering the importance of disseminating knowledge.* One of the primary goals from the very beginning of the first initiative was to become a national clearinghouse of information about PBL. According to the grant proposal,

"In this project, we have undertaken the role of a clearinghouse of information on PBL. Private is searching internationally for strong, undergraduate PBL programs. The Center for Problem-Based Learning staff have made headway in this effort. Through reviewing literature, conducting web research, and traveling to PBL sites, the Center staff have located over 300 faculty members, programs, or institutions using PBL in undergraduate education. We have also developed an internationally known newsletter.... and a web site as a part of our dissemination efforts. In addition, we have begun initial planning for a major conference."

And faculty seemed to agree. As one faculty noted,

"The work done of the Private University Problem-Based Learning Initiative will assist other faculty members in implementation of problem-based learning strategies in their classrooms, but successful implementation of these strategies will require that faculty members be afforded sufficient time to learn about problem-based learning, discuss changes in their courses with their colleagues, locate resources, attend workshops, etc."

*Reward Structure.*

As the grant proposal notes:

"In order for the kind of change that PBL represents to become institutionalized, faculty must receive rewards and incentives for the work that they do as teachers. In order to accomplish this, faculty must learn to document their teaching, and it must be subject to rigorous review from a body of peers. Private has implemented a system of peer reviews of course portfolios."

Our experience tells us that faculty at Private and other colleges and universities will not and cannot devote the necessary talent and time to PBL course and curriculum development, field testing, and improvement if the scholarship involved is not recognized and rewarded. This is an area where Private excelled—by providing time and compensation as well as recognition and reward for effort.

Systematic course design is scholarly work (Boyer, 1990). According to the minutes of a meeting between faculty and administrators to determine how their work on the project would count, the issue was particularly important to junior faculty who were considering whether the investment of time would benefit them in promotion and tenure decisions as much as traditional research. The investment for them to take a scholarly approach to their teaching, they realized, was risky. Such scholarly work includes being content-current in one's field, understanding how the basic principles and concepts of one's field can be most effectively learned by young adults, determining valid and reliable means of assessing student learning, and skillfully delivering the designed course. As we noted in the section about the context of the study, Private responded by providing released time and summer support.

The project provided structures for faculty to be able to document the work they had done in redesigning courses. According to meeting minutes, in order to document such scholarship, the PBL faculty members developed course portfolios, which not only provided information for project assessment and evaluation but also made the work of faculty public. The university held a workshop on the scholarship of teaching, in which faculty members developed their own definition of what it meant at Private as well as an outline of course portfolios. Based on faculty request, project staff set up an external peer review system for PBL portfolios. Two reviewers were identified for each portfolio: a disciplinary expert and a teaching expert. Faculty reported that this process provided them time to reflect on what they had done during the semester, to develop a permanent record of what happened, and to think about improvements.

Private faculty began to view the knowledge they gained as important and worthy of being shared. This is evident in their development of course portfolios, and it is evident in the numerous presentations and peer-reviewed articles that the faculty have developed, which are listed on the faculty dissemination page of the Private Web site. In addition, faculty believed that documentation and peer review would mean that their work was more likely to be valued in promotion and tenure decisions. Knowing that their work would count within the promotion and tenure system gave faculty members the confidence needed for innovation and experimentation.

We found that faculty members were the primary movers of the scholarship of teaching idea. They were the ones who pushed the notion that what they were doing was more than just teaching courses: it was the scholarship of problem-based learning. In that respect, the shift on campus was a grass-roots effort. We now turn to an analysis of how and why this shift in thinking occurred.

### **Faculty-perspectives on change**

At the level of individual faculty members, we examine the scholarly efforts of those specific PBL faculty we interviewed and how they translated the intellectual work involved in teaching into scholarly work.

#### *Producing tangible evidence of scholarship.*

In our interviews with faculty who had implemented PBL, we found that nearly half had published or were hoping to publish a journal article or monograph on some aspect of teaching with PBL. The majority of these faculty had no previous experience publishing on the scholarship of teaching. About 50% of those who were interested in writing papers were involved in two or more projects.

Because it was a built-in expectation for our faculty sample, over 90% of our participants had completed a presentation or workshop. Surprisingly, many reported well over four presentations over the previous academic year. The venues for these presentations varied from presentations to the local campus community, to presentations at national conferences. Almost half of the participants had presented or were accepted to present at international conferences.

All of the faculty had written or were in the process of writing a course portfolio. While this activity in certain settings could be seen as more private than public, several of our participants would make all or part of their course portfolios open to public scrutiny via the grant website. In addition, one faculty member was commissioned by a publisher to turn her course portfolio into a published supplement to a textbook. Further, our informants discussed their portfolios as a product of their scholarly work as teachers. As one participant described it, "we teach so many classes and I've been teaching for about 12 years and I never realized how much thought I had put into teaching a class before, until I had to sit down and document everything."

Five (and possibly more) informants had been invited to do workshops or consulting on PBL. These invitations were frequently triggered by conference presentations or published articles. The workshops varied from invitations from other colleges and universities to invitations from local school districts. Several consultation/workshop opportunities involved international travel.

Finally, at least five of our participants were currently working on grant proposals to extend their scholarly work with PBL. Most of these projects included an extended collaboration with other colleagues. Several proposed grant projects were collaborative efforts with colleagues from other institutions and one was international in scope.

#### *Disciplinary Boundaries and PBL.*

The topics of our participants' scholarly work on teaching with PBL varied, and they most often talked about PBL topics in terms of their disciplines. In most circumstances, the topics focused on how to teach using PBL in specific disciplinary context. For example one faculty commented on a presentation she gave at a conference in her discipline. "It really was very basic, what is problem-based learning, how does it differ from standard didactic teaching, what are the benefits, what the drawbacks, what have we done with it. It was very basic, but it was very well received." Several projects explicitly examined the pedagogical content knowledge of a disciplinary area and were published in disciplinary journals. A few projects were being submitted or had been accepted into special journals on teaching in the discipline. A number of projects outlined particular aspects of teaching using PBL; in particular, descriptions of effective problem designs were common.

Two informants chose a slightly different, yet discipline-based focus. These two presentations explored organizational issues surrounding the implementation of PBL. One faculty member summarized his presentation in the following way, "...but that's what that talk was about, about how to PBLize our department." In contrast, other projects were intended for cross-disciplinary audiences and focused on more general applications of teaching and learning.

#### *Building Collaborative Relationships.*

Seventeen of the participants commented that their writing projects involved collaborations with other faculty. These collaborations varied from collaborations among two or more

faculty within a single department, to collaborations between a faculty in the same discipline but at different institutions, to interdisciplinary collaborations among faculty in different fields. Presentation collaborations included many of the same types of collaborations as writing projects but also included collaborations with community partners, and with campus administrators. Many of the participants described how early conference presentations created opportunities to meet interested collaborators, which then led to additional joint presentations and publications.

In addition three faculty members commented on collaborative efforts with students. Two participants had published or were submitting articles that represented collaborative research with their students. One participant asserted that he felt that all publications he worked on at Private University should include students:

"And one of the problems with trying to publish the science education stuff is that that science education, at least currently, has very little student interaction... And because of that, if I don't have my students involved [I don't publish]... There is no [student] who has shown interest or who has been involved in this at a level that we could publish together. And I really frown upon research that in this environment, Private University, does not involve students."

In this teaching university context, faculty who love the research process found this notion of collaborative research teams of undergraduates invigorating.

#### *Sharing ideas.*

Faculty expressed a variety of motivations for becoming involved in the scholarship of PBL, ranging from the altruistic to self-interested. Many faculty discussed the desire to disseminate the work they were doing to new audiences who might not be exposed to PBL. For presentations at conferences in their disciplines, this lack of exposure could be both a positive and a negative. One faculty member described a presentation with only three attendees. He believed this meager attendance was attributable to faculty in his discipline not "being there yet...there to the point of using problem-based learning in a major way." In contrast, another participant believed her conference paper was accepted at a disciplinary conference "because nobody had ever used PBL..." and "people just wanted to find out what it was." For some of our informants, a receptive audience was a motivation in and of itself. "It was certainly helpful to me because I sort of had an audience now that needed to hear this."

Another participant suggested that passing on her knowledge of how to teach a course through her portfolio allowed other instructors to build upon what she had done:

"And I think it's very refreshing to give the course to someone else to teach. Don't count on teaching it forever, give it to the next person and see where it goes. And that's where the portfolio comes in well, because once I've taught [the course], I gave it to my colleague and she read the portfolio from cover to cover so she didn't have to do the re-planning. But it gave her the freedom to modify what she wanted. It's the old thing of the dwarf can stand on the shoulders of the giant and you can very quickly freshen up that course, if the bulk of the planning is in place. That was nice for her."

While in some sense, this was also a way for faculty to ensure that their ideas were retained whenever the course was taught, it was also a very real interest in sharing ideas and information.

One professor suggested that he shares his course information and appreciates teaching ideas that he gleans from others. He views the process of sharing teaching ideas as similar to how faculty build upon one another's research ideas.

"You know we've got to start sharing this stuff, not keep it locked up and hidden away, afraid somebody's going to steal it. And there's lots of good ideas out there. And part of it, like our portfolio project, is part taking teaching away, opening up the door and sharing what's going on in there, and that's where I sort of think we've got to go next, is to find ways so we're not all reinventing the wheel. And I can take a professor did two units on Africa that are very good. And I'm going to use one of them or modify one of them. She's done most of the work, but it's no different than going to one of these journals over here and seeing what somebody did in a certain topic and using that as the basis of your study. That's where teaching needs to go."

These ideas were in keeping with the scholarship of teaching ideals that suggest that we should make teaching less of a behind closed doors activity but rather one that invites sharing and review.

Several of the faculty expressed great pride in the creative work they were doing with PBL. They were motivated to make this work public because they believed they were truly doing cutting edge work. "I'm working on an article right now that's about the creative writing course, this way I'm thinking of reinventing of teaching creative writing. No one does what I'm doing in creative writing. There's just no way anyone is doing this, so I'm working on that." These faculty recognized the innovative nature of their work and sought to present it to a wider audience.

### *Recognition and Reward.*

For many participants, publishing and presenting on their teaching served a much more practical purpose; it would count toward promotion and tenure decisions. Some faculty spoke directly to the point, such as the Geography professor quoted at the beginning of this paper who states "...I figure if I'm going to be spending time on this rather than doing something else, I've got to have something to show for it." In some corners of Private University, faculty were explicitly encouraged to think of their work on PBL as both a teaching and research opportunity. One team leader encouraged faculty within his team to approach their work with PBL in this fashion.

"I don't want this to be just about teaching. I think there ought to be this nice give and take between what we do in the classroom, what we do in the way of our research and scholarship ... so I wanted them to think about their work with the students as something that had a research angle to it."

At least one participant, however, did not grant themselves the status for publishing on teaching. "But I never thought of myself as a pedagogy person either. ...And in some ways I'm still a little bit leery about writing it, because I know that there is a whole genre of publications out there that deal with pedagogical tools and I really feel like a fish out of

water.” For this participant, without more training or experience specific to education, he would not consider himself expert enough to publish scholarly articles.

While most faculty expressed the view that publishing on PBL would be rewarded at Private, one faculty member who had taken a position at another institution suggested that participation in the PBL initiative might not be valued by all members of the faculty. “I don’t know that if I had stayed at Private that there would have been benefits for promotion and tenure. I think a few people have taken a pretty serious hit.” This, of course, contradicts much of the rhetoric of key administrators. This participant was not concerned however, by how administrators viewed her work, but rather by how her faculty peers (many of whom did not participate in the initiative) would evaluate her scholarship.

In a similar vein, another faculty feared that by spending time on the scholarship of teaching he was becoming distanced from the evolving knowledge base of his discipline. This might have ramifications not only for his knowledge base, but also for how his peers evaluated his work. “I wonder sometimes if I’m drifting too far from geography. That the stuff I’m doing is good for Private; I’m not so sure if I were interested in going somewhere else, how much good it would do me. So that’s a concern that you worry about the way you’re spending your time and doing good work for the institution, but professionally it may not be in your best interests.” Private University’s administrators might influence how the scholarship of teaching was rewarded within the institution, but they are impotent against the culture of disciplinary communities.

## Conclusion

For many of the faculty in our study, the scholarship surrounding PBL allowed them to participate in an intellectual conversation, which they found extremely satisfying. Through collaboration with colleagues at Private, peers within their disciplines or faculty in other places, participation in a scholarly public discussion of teaching was in itself rewarding. As one math faculty member described it, “Because I would think, well you know, I don’t think I do anything different than anybody else does, and then I realize that may or may not be true, but we always benefit from the discussion.” Parker Palmer (Palmer, 1993) suggests that this is precisely the sort of conversation which many faculty hunger for and that will lead to a true transformation of academia.

These conversations can be discipline-based but are sometimes most powerful when they are interdisciplinary. As one respondent told us,

“When you teach an interdisciplinary course, the disciplinary community is not always as clear as it might be in other cases. ...I don’t typically give presentations at communication association meetings...but those are circles that I’ve not been active in, and vice versa, had people whose background was primarily on speech doing kinds of rhetorical analysis we do in composition. You know, so that would be a change, this kind of moving in and out of circles. ”

Private University encouraged these cross-disciplinary conversations both on campus and with faculty and experts at other institutions across the country and around the world.

Educators such as Lee Shulman (Shulman, 1993b) have urged faculty and their campuses to end the “solitude” of teaching and create a community-wide interdisciplinary conversation about teaching. These educators argue that it is only through public conversation and scrutiny that the value of the scholarship of teaching will begin to gain currency in the recognition and reward of faculty.

For faculty who are committed to teaching using PBL, the opportunity to balance the efforts required to teach with the need for published scholarly work makes the issue of the scholarship of teaching particularly important. Carol Colbeck (Colbeck, 1998), in her study of faculty work found that faculty who found ways to integrate the demands of teaching and research found these efforts enhanced both their research and teaching outcomes. For the faculty in our study, the opportunities to publish and present on the scholarship of their teaching frequently opened up other potential venues for making the intellectual work of teaching public. These venues were local, national, international, and both disciplinary and interdisciplinary. For many of our participants, projects they developed on the scholarship of teaching featured collaborations with other colleagues, a link for building the kind of supportive, yet critical community needed to bring the scholarship of teaching to level of respect it deserves (Hutchings, 1994).

For new, untenured, faculty, this public attention to teaching is particularly important. Young faculty quickly discover that the current reward structure favors time on research over time on teaching. Their perceptions are not incorrect. On average at all four-year institutions other than liberal arts colleges, faculty salaries are higher for faculty who spend time on research (Fairweather, 1993).

However, administrative support for the scholarship of teaching can only reach so far. Promotion and tenure decisions are, to a great extent, based upon an evaluation by disciplinary peers. Thus, the value systems of faculty within departments and in disciplinary communities are a key component to widespread acceptance of the scholarship of teaching and learning. These value systems, entrenched in a 100-year tradition of the primacy of basic disciplinary research are slow to change. Administrative rhetoric and monetary incentives can only go so far. As innovative faculty such as the ones in our study continue to make public the scholarly work they do as teachers, these attitudes and values are slowly shifting.

## References

- Albanese, M. A. (1993). Problem-based learning: A review of literature on its outcomes and implementation issues. *Academic Medicine*, 68(1), 52-81.
- Barr, R. B. & Tagg, J. (1995). From teaching to learning: A new paradigm for undergraduate education. *Change* 26 (6), 12-25.
- Boyer, E. L. (1990). *Scholarship reconsidered: Priorities of the professoriate*. Princeton, NJ: Carnegie Foundation for the Advancement of Teaching.
- Colbeck, C. L. (1998). Merging in a seamless blend: How faculty integrate teaching and research. *Journal of Higher Education*, 69(6), 647-671.



- Fairweather, J. S. (1993). *Teaching, research, and faculty rewards* (Research Report). University Park, PA: National Center on Postsecondary Teaching, Learning, and Assessment.
- Glassick, C., Huber, M. T., & Maeroff, G. L. (1997). *Scholarship assessed: A special report on faculty evaluation*. San Francisco: Jossey-Bass.
- Hutchings, P. (1994). Breaking the solitude of teaching. *Metropolitan Universities: An International Forum*, 5(1), 19-25.
- Hutchings, P. (2000). Promoting a culture of teaching and learning. In D. DeZure (Ed.), *Learning from Change* (pp. 1-7). Sterling, VA: Stylus Publishing.
- Major, C., & Palmer, B. (2002, April 2002). *Influences of Implementing Problem-Based Learning on Faculty Pedagogical Content Knowledge*. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.
- Palmer, P. (1993). Good talk about good teaching: Improving teaching through conversation and community. *Change*, 25(6), 8-13.
- Patton, M. Q. (2002). *Qualitative Research and Evaluation Methods* (3rd ed.). Thousand Oaks, CA: Sage.
- Schon, D. A. (1995). The new scholarship requires a new epistemology: Knowing-in-action. *Change*, 27(6), 26-34.
- Shulman, L. S. (1993). Teaching as community property: Putting an end to pedagogical solitude. *Change*, 26(6), 6-7.
- Shulman, L. S. (1999). Taking teaching seriously. *Change*, 31(4), 11-17.